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WHAT IS CLAIMED IS:

- 1. A method for delivering a biological material using a gene gun, comprising:

 providing the gene gun comprising a pressurized chamber, a sprayer, a controller and a
 material delivery system;
- placing a sample solution into the material delivery system, wherein the sample solution comprises at least the biological material;
 - triggering the gene gun and providing a gas through the control of the controller to the pressurized chamber until the gas establishes a pressure;
 - releasing the sample solution from the material delivery system, so that the sample solution is accelerated by the gas in the pressurized chamber; and
 - discharging the sample solution out of the sprayer, wherein the sprayer includes a spray nozzle and a spray tube, and the spray nozzle comprises an interior contour, wherein the interior contour of the spray nozzle comprises a diverging part and a converging part and the spray tube is a diverging straight tube, so that a discharge speed of the sample solution is supersonic and the biological material is evenly injected into a target.
 - 2. The method of claim 1, wherein the biological material is a nucleic acid.
 - 3. The method of claim 1, wherein the biological material is a protein.
 - 4. The method of claim 1, wherein the biological material is a virion.
 - 5. The method of claim 1, wherein the biological material is a vaccine.
- 6. The method of claim 1, wherein the biological material is an immunogen for cancer immunotherapy.
 - 7. The method of claim 1, wherein the sample solution is accelerated to a speed of 200-300 m/s by the gas.
 - 8. The method of claim 1, wherein a pressure at an outlet of the sprayer is about 1

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atmospheric pressure.

- 9. The method of claim 1, wherein the spray nozzle further comprises a spray neck positioned between the diverging part and the converging part, and a range of the interior contour of the converging part includes:
- $r_t < R_t < 2r_t$, wherein R_t represents a curvature radius of the converging part, r_t is a radius of the spray neck; and wherein $\Theta < 15$ degrees, wherein Θ is an angle between the diverging part and a center
 - axis of the spray tube.
 - 10. The method of claim 1, wherein the gas includes a nitrogen gas or a helium gas.

11. A method for gene transformation by using a gene gun, comprising:

- providing the gene gun comprising a pressurized chamber, a sprayer, a controller and a material delivery system;
 - placing a sample solution into the material delivery system, wherein the sample solution comprises at least a nucleic acid;
- triggering the gene gun and providing a gas through the control of the controller to the pressurized chamber, wherein the gas is a nitrogen gas or a helium gas;
 - releasing the sample solution from the material delivery system after the gas in the pressurized chamber establishes a pressure, so that the sample solution is accelerated by the gas in the pressurized chamber; and
- discharging the sample solution out of the sprayer, wherein the sprayer includes a spray nozzle and a spray tube, and the spray nozzle comprises an interior contour, wherein the interior contour of the spray nozzle comprises a diverging part and a converging part and the spray tube is a diverging straight tube, so that a discharge speed of the sample solution is supersonic and the biological material is evenly injected into a target.

- 12. The method of claim 11, wherein the sample solution is accelerated to a speed of 200-300 m/s by the gas.
- 13. The method of claim 11, wherein a pressure at an outlet of the sprayer is about 1 atmospheric pressure.
- 14. The method of claim 11, wherein the spray nozzle further comprises a spray neck positioned between the diverging part and the converging part, and a range of the interior contour of the converging part includes:
 - $r_t < R_t < 2r_t$, wherein R_t represents a curvature radius of the converging part, r_t is a radius of the spray neck; and
- wherein Θ < 15 degrees, wherein Θ is an angle between the diverging part and a center axis of the spray tube.
 - 15. The method of claim 1, wherein the nucleic acid is used for gene therapy.